AGRICULTURE RECONSTRUCTION AND DEVELOPMENT PROGRAM FOR IRAQ

GRAPE VARIETY BENCHMARKING PROJECT
Final Report

November 2005

This publication was produced for review by the United States Agency for International Development. It was prepared by Development Alternatives, Inc.

Contract No. RAN-C-00-04-00002-00

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I. Executive Summary

The grape tree is widely planted in Dahuk, Erbil and Sulaymaniyah governorates, where it grows well thanks to suitable climatic condition and soils. Different varieties belonging to the genus *Vitus Vinifera*, known as the European grape or the grape of the old world, are the most widely grown grape fruit in Iraq. Grape production provides employment and income for hundreds of thousands of families in Dahuk, Erbil and Sulaymaniyah. Grapes are used to produce syrup, raisins, vinegar, fresh grape juice, and alcoholic drinks.

Due to the economic importance of grape production in Dahuk, Erbil and Sulaymaniyah, the Ministries of Agriculture and Irrigation in Erbil and Sulaymaniyah, in cooperation with ARDI, are working to improve existing vineyards, expand the area planted to grapes through the establishment of new rain-fed and irrigated vineyards, and encourage grape producers to adopt modern cultivation technologies. The governorates of Dahuk, Erbil and Sulaymaniyah are particularly suitable for the establishment of raid-fed vineyards due to a high level of precipitation, with an average seasonal rainfall of approximately 500-1200 mm. There are also many springs and water canals that can be used for establishment of irrigated vineyards.

In order to facilitate the establishment of new vineyards, ARDI hired a consultant to benchmark selected varieties of vine stock for cuttings. These cuttings will be used to produce seedlings that will be planted in new vineyards. Based on the results of this study, there are two proposed projects:

1. Establish a nursery to plant cuttings of the selected grape varieties and produce seedlings;

2. Use the produced seedlings to establish new vineyards with specific fields for different varieties of grapes (commercial, table and raisin grape varieties). Provide training in using modern cultivation practices in establishing the vineyards.

II. Project Implementation

1. Administration and forming the teams

Three labor field teams were mobilized, one team for each governorate (Dahuk , Erbil and Sulaymaniyah). Each team is comprised of an Assistant Project Manager, a supervisor, three laborers, and the vineyard owners. The teams were advised by the Project Manager.

The subcontractor developed and maintained a personnel tracking spreadsheet including the following information for each team member: 1) name, 2) sex 3), age, 4) hiring date and 5) number of days worked per week.

2. Field training courses and identification of the varieties

The Project Manager conducted a field training course in the existing vineyards for identification and benchmarking techniques based on type of cluster, color and leaf shapes. The course was attended by the Assistant Project Manager, supervisors, labors and vineyards owners. During the training courses, the varieties from which cuttings were to be collected were selected.

3. Equipment and tools

The subcontractor prepared and purchased all needed equipment such as labels, steel wires, stationery, markers, spray paints and transportation.

4. Project implementation status

A total of 20 varieties have been selected from the best vineyards in Dahuk, Erbil and Sulaymaniyah. The varieties are *Rashmiree, Rashmiree Wazha, Bae-dank-seedless, Thomson-seedless, Tre-Rash, Rash-Miow, RashMiow (Elongated) , Taefee, Kamali, Soor Ssinaee, Kazhaw, Sarquola, Zarek, Soraw, Halwani ,Des-AlAnnz, Awilka, Hejazi-Spee.* See section VI. for a description of each variety.

A total of 38,972 trees have been selected from the best vineyards in Dahuk, Erbil and Sulaymnaiyah: 23,505 trees from Dahuk, 7,795 from Erbil, and 7,672 from Sulaymaniyah (see Annex No.1, Tables 1, 2 and 3).

III. Field locations and weekly distribution of field teams

Global Position System (GPS) devices were used to record the locations of the benchmarked vineyards (Annex No. II Tables 4, 5 and 6 show the longitude and latitude of the field locations)

The work lasted for five weeks during October and November 2005 (see Annex No. III, Tables No. 7, 8 and 9 showing weekly distribution of field teams in Erbil, Dahuk and Sulaymaniyah.)

IV. Outputs

The outputs can be described as:

1. A total of 38,972 vines have been benchmarked;
2. A total of 20 varieties of grapes have been selected from the best vineyards in the governorates of Dahuk, Erbil and Sulaymaniyah;
3. The Assistant Project Manager, supervisors, labors and vineyard owners have been trained to identify grape varieties and use modern methods of cultivation, including determining the most suitable time and proper method for preparing the canes and cuttings;
4. Information has been recorded regarding the sites, numbers and varieties of grape vines in Dahuk, Erbil and Sulaymaniyah. This information can be used as resource for future development programs;

5. The most important output of the project is to facilitate the production of pure and certified seedlings from each of the 20 selected grape varieties. The selected varieties should be planted in a mother orchard to serve as a source for producing cuttings in the future, and for purposes of study and research.

V. Project impact

1. The establishment of vineyards to increase the yield of grape varieties suitable for commercial production, to subsequently increase grape producers' income;
2. The adoption of new methods for producing seedlings, which result in earlier production of grapes, as opposed to the traditional method of direct planting of the cuttings in the field;
3. The project encourages grape growers to exchange ideas and grape varieties among themselves, and to establish a Grape Growers Association in the future; and
4. The project will encourage production of grapes for new uses, such as commercial uses.

VI. Brief description of some grape varieties

A great number of different grape varieties are found in Erbil, Dahuk, and Sulaymaniyah, where studies have shown that the *Vitis Vinifera* genus originated. The following are brief descriptions of the most important varieties:

A. Table grape varieties

1. Kamali: This is one of the local Iraqi grape varieties, a result of natural mutation from the Taefee–red variety. It is widely planted in central Iraq and in irrigated vineyards in Dahuk, as well as in some vineyards of Erbil and Sulaymaniyah governorates. This variety is considered to be the best table grape, with excellent commercial properties. Therefore, it is desirable to expand production of this variety in Dahuk, Erbil and Sulaymaniyah, especially in the irrigated areas. Attention must be paid to the pruning and training techniques used to cultivate this variety, including the use of wired pergolas and cordon system of T shape form.

2. Rash–Miow: This variety is considered to be the most famous variety in Dahuk, where it is grown in rain-fed areas. The fruits of this variety ripen early (beginning of July), and can be used to produce excellent quality black raisins. This variety should be planted in Erbil and Sulaymaniyah governorates. This variety is also grown in the central governorates, where it is known Zaitouni.

3. Rash–Miree: This variety is considered to be an excellent table grape. It is planted in several areas of Sulaymaniyah governorate, especially in Dokanyan and Shahar–Bazar. In Erbil governorate, it is planted in the Rawanduz area. This variety has good commercial properties, but its flowers are pistillates (genogene) so it needs pollinators. It should therefore be planted among perfect hermaphroditic varieties.

Regarding the new variety of Rashmiree Wajha, which is mentioned below (see #11), it is considered to be a replacement variety, and attention should be paid to expanding its cultivation.

4. Taefee–Red: This variety is planted in Dahuk, Erbil and Sulaymaniyah, especially in the irrigated areas. It is also planted in rain-fed areas with deep and wet soils. Its origin is Saudi Arabia, and it is an old variety known in several areas of the world. There are several clones of this variety, including Egaimy, Ebraheemi, Omeeri, and Taefee–Koya. It is considered to be a good table grape. The inflorescence of this variety is hermaphroditic and it is a good pollinator for the pistillate varieties.

5. Des–Alannz: This variety is planted throughout Iraq. There are a few vines of this variety in Erbil, Dahuk and Sulaymaniyah, where it is called Janooby. It is an old variety and is planted in several countries and has many clones including Gern–Algazal, Abu–Albotool, and Abu Khlal. This variety is distinguished by its high (heavy) productivity and its clusters, which are large in size with an attractive look. The berries are elongated and big. The infloresence of this variety is hermaphroditic; therefore it could be a good pollinator for the pistillate varieties.

6. Sarquola: This is one of the known local varieties in Sulaymaniyah governorate. Usually it is consumed as a fresh fruit. The cluster is cylindrical and often ramified, of medium size with little compaction. The berries are an elongated – cylindrical form, with a wide end curved toward inside. The irregularity of the berries should be noted. This is due to its inflorescence, which is pistillate, and the fertilization does not occur properly. This variety has good specifications and good marketing suitability.

7. Soraw: This variety is also called Sorshame. There are a few of these vines in Shaqlawa, Harir, Rawanduz and other areas in Erbil, Dahuk and Sulaymaniyah. The berries are round with a red color, round in shape and big in size with a nice look. It resembles the Halwani variety. It tastes delicious because there is coordination between the sugar content and the acidity (sourness). It could be considered as an excellent table variety. Its inflorescence is pistillate type so it needs to be planted near pollinators.

The training and pruning practices that are currently used to cultivate this variety in Iraq are not suitable for its biological properties, and it is therefore not planted on a large scale. It is worthwhile to continue studying this variety and to concentrate on its propagation and extension.

8. Jav-Ga*:* The name means “the bull eye.” It is one of the known local varieties in Dahuk governorate. The clusters of this variety were noticed in Eminki village. The cluster has a cylindrical shape, and the berries are big and round, with a dark-black color. This is a late variety, with high production. This variety has good properties regarding the shape and look. It should be studied in order to understand the proper cultivation techniques for its biological and morphological properties.

9. Bae-Dank: This is a seedless variety that is not native to northern Iraq. It is planted in the orchards of Wazha village in Sulaymaniyah Governorate. This variety has excellent commercial properties, equivalent to known varieties as Thompson Seedless, Barlete, and others. Its cluster is short cylindrical. The berries are compact, light-yellow

in color, round in shape with little elongation, organized set, and big size. The skin is thin. The pulp is fleshy and juicy, with a sweet taste with a little sourness. It is suitable for a large-sized raisin. This variety should be studied to understand the proper cultivation techniques for its biological and morphological properties, to increase its propagation and expand its cultivation.

10. Thompson Seedless: The original land of this variety is Iran. It is planted all over the world, and known by many names. In Erbil, Dahuk and Sulaymaniyah it is known as Kishmishi, in Egypt it is called Banati, in Europe it is called Sultanina, and in Australia it is called Sultana. It is considered to be the best seedless variety, suitable for the raisin industry. In Iraq, it is planted in several areas, especially the central part of the country. Its production is limited in the northern governorates due to low productivity, despite suitable soil and climatic factors, due to improper methods of pruning and training. The properties of this variety are such that the basal buds (eyes), which form on fruiting canes, are low in fruit set. Therefore, short or severe pruning of the spur results in low productivity. It is preferable to leave a larger number of fruiting canes of 8-10 eyes (buds) on the vine, beside the renewal spurs. This system of pruning is called "mixed pruning." Therefore, it is necessary to provide training in proper cultivation techniques for this variety to improve production in Iraq.

11. Rashmiree Wajha This cluster variety resembles a clone of the famous Rash miree variety, but upon further study it appears to be a new variety with excellent properties that exceed the properties of the true Rash miree variety. It is planted in the governorates of Erbil and Sulaymaniyah. This new variety is distinguished by the cylindrical form of its cluster, which has a medium size and compaction of its berries, which are round with little elongation (oval shape) and big in size. The color of the berries is dark black, and they are covered with a thick layer of wax. The pulp is fleshy. There are 2-3 seeds of medium size in each berry. The color of the juice is light pink with a sweet taste and a distinguished flavor. The Total Soluble Solid content (TSS) was 17.5% on August 30, 2001. The average length of the cluster is 16 cm, and the average weight is 300 g. The flowers of this variety are hermaphrodite, which is self-fertilizing, and as a result there is a high percentage of cluster formation. The berries are compact and not loose as in the real variety of Rash-miree, which has pistillate flowers and requires a pollinator.

This variety is also distinguished by its strong and vigorous vegetative growth and high productivity. Its biological and morphological properties will continue to be studied in order to give the proper recommendations and information regarding its cultivation, including pruning and training, and to expand its production in Erbil, Dahuk and Sulaymaniyah and throughout Iraq.

12. Soorssinaee: This variety was seen in one vineyard located in Ja'afaran village of Qaradagh area, in Sulaymaniyah. This is a very old village that is famous for its vineyards. There are large areas of such vineyards, which contain of several grape varieties. This variety is called by different names including Sooraw and Sadani–Black, which are incorrect. It also resembles Kamali variety, in appearance only. This variety has excellent commercial properties. Its cluster is big in size and the berries are oval in shape with a little elongation. The color of the berries is dark–red or violet with some of

black color. The skin is thin and can be easily cut. The pulp is juicy and fleshy with a sweet taste. The percent of TSS was about 17% in August 2002.

This variety is distinguished by the nice shape of the cluster and the compaction and organization of its berries and its high productivity. Two clusters are often formed on the fruiting shoot. The vegetative growth of this variety is vigorous; the shoots grow more than 3 meters. It is planted in rain-fed areas, and its flowers are probably hermaphroditic. It could be considered as a good table grape and it is worthwhile to continue its study.

B. The Industrial Grape Varieties

1. Tre-Rash: This is a local grape variety that is planted in several areas of Erbil and Sulaymaniyah. It has several names including Suleimany, Khoshnow and Rashka. It is a late black variety. It is a good table grape, and could be used in the juice, wine and raisin industries. The cluster is usually conical in shape, although it is sometimes cylindrical with a small shoulder. Its size is medium to big. The berries are round and in some clones often have some elongation with medium compaction. The color of the berries is dark-black or red-violet. The berries are covered with a thick layer of bloom. The pulp is fleshy with little juice. The skin is thick, cannot be cut easily, and has a touch of tannin. The color of the juice is light pink. There are 2-3 seeds in each berry of medium size. The TSS was about 16.2% on Aug. 17, 2001, and increased to 17.5% on Aug. 30, 2001. The average length of the cluster is 16 cm and its weight is between 360-400 g. The time of ripening for this variety for industrial purposes is September, when the TSS can reach to more than 18%. The clusters can be left until November without any injury.

This variety is recognized by its high (heavy) productivity and by its resistance to drought, relative to other varieties. The inflorescence of this variety is hermaphroditic and it is a good pollinator for pistillate varieties as Rush-Miree, Miranee and others. This variety is considered to be an old variety and has several clones that should be studied to understand their biological properties to select the suitable ones for expanded cultivation.

2. Zarek: This variety is the most widely planted variety in Dahuk, where it is planted in rain-fed areas. There are several villages which specialize in its cultivation including Besefki, Darkechnik, Swaratuka, Ashawi and others. This variety ripens at the end of September, and is considered a good late variety. It is suitable for fresh consumption, juice, wine and raisin production. The cluster is conical with small shoulders. The berries are round and compact with a white-yellow color, and are covered with a medium layer of bloom. The pulp is fleshy and juicy. The skin is somewhat thick with a touch of tannin, which decreases when the fruits are fully ripened. There are 2-3 seeds in each berry, which are of medium size. The juice is colorless with a sweet taste and nice flavor. The TSS was about 16% on September 12, 2001. The cluster was 20 cm long and its weight about 440 g. The inflorescence of this variety is hermaphroditic and it is a good pollinator for the pistillate varieties. This variety is recognized by its high (heavy) productivity and its response to short spur pruning.

The fruits have good potential in marketing. It is an old local variety and could be considered as the best industrial variety. The time of its ripening for industrial purposes

is at the end of September or beginning of October, when the TSS can reach more than 18%. The clusters are distinguished by their ability to be left on the plant until November or later without any damage.

3. Kazhaw: This variety is planted in the grape vineyards of Jenkinian and Jafran villages in Sulaymaniyah, and in the neighboring rain-fed areas. It ripens in the mid-season (August). The cluster is cylindrical and small-medium in size, with round berries of medium size, compact and of dark black color. The pulp is fleshy and juicy, and the skin is somewhat thick. There are 2-3 seeds in each berry. The color of the juice is light pink, with a sweet taste with little sourness. The TSS was about 19.5% on September 27, 2001. The average length of the cluster is 15 cm and its weight is 170 g. It is suitable for the juice and wine industry. The pruning practice is to leave a number of fruiting canes with 6-8 buds (eyes) with renewal spurs. Then, the vines are left creeping on the ground.

This variety is distinguished by its high (heavy) productivity and resistance to fungal diseases. It is considered a good variety for the raisin industry. It is worthwhile to continue studying its biological and morphological properties.

4. Awilka: There are limited numbers of this variety in the vineyards of the villages Sitkan, Mawlyan, Dargala and Berserin of Erbil. From the initial study of this variety, it could be considered as the best variety for the juice and wine industry. It is an early variety which ripens in mid-July. The cluster is conical with shoulders. It resembles the Tre-Rash variety and is sometimes ramified. The berries are round in shape with a little elongation, medium size, and dark black color covered with a thick layer of bloom. The pulp is juicy and the skin is thin and can be easily cut. There are 1-3 seeds in each berry, which are small in size. The color of the juice is dark red, with sweet taste with a touch of sourness. The TSS was about 21% on September 24, 2001 and the acidity was 0.44%. The average length of the cluster is 22 cm and its weight is between 220-250 g. It is planted in rain-fed areas.

This variety is distinguished by its high (heavy) productivity and resistance to fungal diseases, despite improper pruning and training practices that are currently used. The study of this variety should continue, and serious efforts should be made to propagate it and to extend its cultivation in northern Iraq.

5. Besola This new variety is cultivated in Besola in Ashawa village, which is in Dahuk province. The cluster is conical in shape with medium size shoulders of average length and size. The average length of the cluster is about 17 cm. The berries are round or spherical, of medium size and with compaction. The color is dark–black with some of dark–red to violet color. The skin is somewhat thin and cannot be cut easily, and is covered with a layer of medium size bloom. The pulp is less fleshy but juicy, with a sweet taste with a touch of sourness. There are 2-4 medium sized seeds in each berry. The color of the juice is light–pink. The TSS was about 19.4% on Sep. 17, 2002. The average weight of the cluster is between 450-700 g (in both irrigated lands or in rain-fed lands).

This variety has excellent properties. The vines are distinguished by vigorous vegetative growth, resistance to drought and high productivity. The average production is 30 kg per

vine in rain-fed cultivation. The fruiting shoots often bear two clusters. It is resistant to fungal diseases and to the leaf hopper.

The fruits of this variety ripen in the second half of September, although the clusters could be left on the vine until the end of October without any damage. The shape and the look of the clusters are well-organized, with compact berries despite its pistillate flowers. It is a juicy variety with good properties for marketing, making it suitable for commercial production. It has been noticed that the percentage of cane maturity is good despite the heavy productivity.

The pruning system used in Ashawa village is to leave the fruiting canes very long, reaching up to 2 meters in length. This variety could be planted with success in most of the governorates in Iraq, and the fruits could be consumed as table grape and used for commercial production. Therefore, it is necessary to continue to study this variety and take a large number of cuttings to expand its cultivation.

In addition to these varieties, there are others could be used for commercial production, including Aswad-Wazha, Doshawi, Marmarik, Rasooli, Chinari, Sadani-Spee and others.

C. Introducing and selecting the distinguished varieties of grapes

In spite of the large numbers (over 85) of grape varieties that exist in Erbil, Dahuk and Sulaymaniyah, it is necessary to expand the cultivation of some varieties that have appropriate properties for commercial use. For example, the cultivation of some seedless varieties that are good table varieties should be expanded. These varieties include:

1. King Rubi: This variety is a seedless variety of red color. It is distinguished by its desirable properties. It has high (heavy) productivity, and the time of its ripening is in September and the clusters can be left on the vine until November. It is one of the table grape varieties.

2. Perlette: This is a good early seedless variety. In Baghdad the fruits ripen in the beginning of July. It is distinguished by its high productivity and delicious taste. The berries are green-yellow and change to pure yellow when ripe, and have a nice look. Usually, it is consumed as a fresh fruit, and it could also be dried as a raisin.

3. Buhrizi: This variety is considered a mid-early one; its fruits ripen in Baghdad at the end of June and beginning of July. It is distinguished by good commercial properties. The berries are elongated with a pure yellow color. There is one variety in Sulayaniyah called “Mandeli” that has very similar properties.

4. Abbassi: This is one of the black mid-season varieties. It is distinguished by excellent production and quality properties. It should do well in the northern areas of Iraq, especially in irrigated lands. This variety needs pollinators because of its inflorescence, which is pistillate type.

5. Baitamooni: This is considered as the best white table grape. Its origin is Lebanon. It ripens in Baghdad in August and could be left on the vine until October without any damage. The cluster is of medium size with a nice look. The berries are big in size and elongated with white yellowish color. The skin is thin and the pulp is fleshy and juicy with a sweet and delicious flavor. It will grow well in the northern area of Iraq, because the environment there is similar to the Lebanese environment. Therefore, I would recommend extending its cultivation and propagation especially in irrigated areas or in areas with deep soil and high moisture content.

6. Halwani: This is also considered to be a good table grape. Its origin is Lebanon. It ripens in mid-August, and is considered a late variety. The clusters can be left on the vine until November without any damage. The clusters are a big size, with a nice look. The berries are round, big in size with medium compaction, and white yellow with a touch of red color or sometimes dark red. The skin is thin and can be cut easily. The pulp is fleshy and crunchy with a sweet taste with a touch of sourness. There are 3-4 seeds in each berry of medium size, which cannot be easily separated. This variety is distinguished by high productivity when trained on pergolas. Its quality is best when planted in the northern areas. Its cultivation should be expanded to large-scale propagation, especially in the irrigated lands.

7. Superior Seedless is an excellent variety from the United States**.**

8. Kishmish Chorni (Black seedless) is an excellent Uzbekistan variety.

VII. Recommendations

- It is necessary to contact the owners of the benchmarked vineyards to coordinate with them regarding time of pruning and preparing of cuttings, and to advise them on the correct method of pruning and the number of buds to be left on the trees.

- It is proposed that the same supervisors implement the above mentioned work in each governorate in the beginning of the January, 2006 due to their knowledge of information about the locations and selected vineyard owners.

- The vineyard nursery sites in each governorate must be identified. Each site must have an area of at least three hectares, in order to be properly prepared for planting the cuttings and conducting the necessary cultivation practices, including two versus and vertical plowing with 30 cm of depth and fining and mixing the soil with organic matter.

- The nursery sites must be prepared with holes of 4-6 meter length, 2 meter width and 25 cm depth, in order to be prepared for planting of the cuttings. The holes should be covered with sandy soil from the river, and the sites must be irrigated as necessary.

- The cuttings should be 20-25 cm in length with 3-4 buds or more, and should be collected in a bundle of 50 cuttings together and tightened by wire. This process must be well-controlled to avoid mixing the varieties. After 2-3 days the bundles should be

transferred to the nursery sites with fixed labels for each variety, and should be put immediately in the holes and covered with sandy soil. The site maps should be prepared for the varieties and holes. The remaining canes should not be used more than one week after pruning in the field.

- In the case of preparing the cuttings from the vineyards for the nursery sites, it is preferable to collect the canes in lengths of at least one-meter immediately after pruning. The canes should be bundled and transported to the nurseries and buried in the holes within four days to avoid dryness.

- The collection of the cuttings should start in the warm sites first, such as Erbil Plane, in January 2006. In the cold areas, the collection of the cuttings should be started in February and March 2006 and can be continued in high-altitude areas until April 2006.

- It is preferable to use rooting hormones (Seradex No.3) for the hard cuttings in order to increase the rooting success rate. One kilogram of Seradex is enough for 12,000-15,000 cuttings. The bundle of cuttings should be put in water for four hours to compensate for the lost water before using the Seradex. The cuttings should then be planted immediately in the nursery.

- The planting of prepared cuttings should be started in late January or early February 2006. Each variety should be planted according to availability, and should be isolated to avoid mixing.

- The exchange of cuttings between governorates should be conducted as quickly as possible according to the distribution table. The varieties should be clearly labeled to prevent mixing varieties.

- It is preferable to use drip irrigation systems in the nurseries. To facilitate this, the vines should be cultivated on flat land with straight lines, and not in furrows. The rows should be spaced alternately at 30 cm and 100 cm.

- The distance between cuttings should be about 10 cm in the rows. The space between the lines should be covered with polyethelene film for mulching, and the drip pipes should be put between the rows under polyethelene film.

- In the case of a furrows irrigation surface system, the distance between furrows should be 75 cm, and planting of cuttings should be on the furrow shoulder with a distance 7-10 cm between cuttings.

VIII. Training and Extension

1. Extension and field demonstrations for grape producers are very important in order to increase their knowledge of proper methods of training and pruning practices. Small (one donum) demonstration vineyards should be established in Dahuk, Sulaymaniyah and Erbil. The demonstration vineyards should be established on the land of grape producers

who have a desire to improve cultivation practices. It is also necessary to prepare the lands of these demonstration vineyards before planting, using modern scientific methods.

2. Training courses should be organized for agricultural monitors, local leaders and grape producers Erbil, Dahuk and Sulaymaniyah during the first six months of the year 2006. These courses should include the following subjects:
   - Pruning and training systems for both irrigated and rain-fed areas;
   - Budding and grafting in order to change the variety; and
   - Different agricultural operations and practices in vineyards.

3. A project should be implemented for grafting the good new commercial varieties to the old vines in order to improve the quality of the grapes and accelerate production.

Annex I

Number of Benchmarked Varieties

Table No.1: Total number of selected grape vines benchmarked in Dahuk governorate													
#	Village	Sub-District	District	Grape Varieties									
				Kamali	Zarek	RashMiow (Elongated)	Taefee	Rashmiow	Hejazi-Spee	Jav-Ga	Besola	Thomson-seedless	Rashmiree	Tre-Rash
1	Bari Bahar	Zaweta	Dahuk Center	2,000					20			20		
2	Bari Bahar	Zaweta	Dahuk Center	1,500										
3	Besifki	Mangesh	Dahuk Center		5,000									
4	Besifki	Mangesh	Dahuk Center			1,300								
5	Baro Hajar	Mangesh	Dahuk				1,800							
6	Alkina	Mangesh	Dahuk					6,000						
7	Badi	Zaweta	Dahuk					1,500						
8	Khizawa	Batofa	Zakho						25					
9	Nasarka	Dahuk	Dahuk					2,000						
10	Eminuk	Zawita	Dahuk Center							25				
11	Ashawa	Sarsink	Amadi								150			
12	Ashawa	Sarsink	Amadi								550			
13	Ashawa	Sarsink	Amadi								100			
14	Tazhika	Sarsink	Amadi								500			
15	Maidan Rovi	Sarsink	Amadi								410			
16	Siyaratika	Sarsink	Amadi										115	200
17	Bagera	Mangesh	Dahuk	290										
Total				**3,790**	**5,000**	**1,300**	**1,800**	**9,500**	**45**	**25**	**1,710**	**20**	**115**	**200**

Grand total of grape varieties benchmarked in Dahuk Governorate through 10/31/05: 23,505 vines

Table No. 2: Total number of selected grape vines benchmarked in Erbil governorate															
#	Village	Sub-District	District	Grape Varieties											
				Rashmiree	Thomson-seedless	Kamali	Tre-Rash	Rash-Miow	Soraw	Halwani	Taefee	Des-AlAnnz	Zarek	Rashmiree Wazha	Awilka
1	Ainkawa Center	Ainkawa	Dahuk Center		54							33		319	
2	QaraChinaga	Qushtapa	Dahuk Center		5	288		1		116		28			
3	Shaqlawa center	Shaqlawa	Dahuk Center	41	48	4	1,310	11	14		7	2			
4	Shaqlawa center	Shaqlawa	Dahuk Center	18		3	471		35		11				
5	Shaqlawa center	Shaqlawa	Dahuk	8		1	213		3						
6	Shaqlawa center	Shaqlawa	Dahuk				862		4		22				
7	Upper Aquban	Hiran	Dahuk	300											
8	Upper Aquban	Hiran	Shaqlawa	164											
9	Upper Aquban	Dahuk	Dahuk	51											
10	Upper Aquban	Hiran	Dahuk Center	48											
11	Kolka Rash	Hiran	Shaqlawa		27	59	60	71			65		40		
12	Gird Jotyar	Ainkawa	Erbil Center	15	1,562										
13	Spegara	Hiran	Shaqlawa	73											
14	Shaqlawa	Shaqlawa	Shaqlawa	108											
15	Pongina	Hiran	Shaqlawa	136											
16	Sitkan	Diana	Soran	101											

Table No. 2 continued: Total number of selected grape vines benchmarked in Erbil governorate															
#	Village	Sub-District	District		Grape Varieties										
				Rashmiree	Thomson-seedless	Kamali	Tre-Rash	Rash-Miow	Soraw	Halwani	Taefee	Des-AlAnnz	Zarek	Rashmiree Wazha	Awilka
17	Sitkan	Diana	Dahuk	71											
18	Sitkan	Diana	Soran	21											
19	Sitkan	Diana	Soran	164											
20	Sitkan	Diana	Soran	248											
21	Sitkan	Diana	Soran	50											
22	Shaqlawa	Shaqlawa	Shaqlawa	67					62						
23	Dargala	Rawanduz	Soran												200
24	Dargala	Rawanduz	Soran												100
Total				**1,684**	**1,696**	**355**	**2,916**	**83**	**118**	**116**	**105**	**63**	**40**	**319**	**300**

Grand total of grape varieties benchmarked in Erbil Governorate through 10/31/05: 7,795 vines

Table No. 3 Total number of selected grape vines benchmarked in Sulaymaniyah governorate																
#	Village	Sub-District	District	Grape Varieties												
				Rashmiree	Rashmiree Wazha	Bae-dank-seedless	Thomson-seedless	Tre-Rash	Rash-Miow	Taefee	Kamali	Soor Ssinaee	Kazhaw	Sarquola	Zarek	Soraw
1	Wazha	Chowarta Center	Dahuk Center		7	33	8									7
2	Wazha	Chowarta Center	Dahuk Center		36	50	4									14
3	Halabja Center	Sirwan	Dahuk Center		70	35	88	35	104	104	70		35	68	24	
4	Welader	Arbat	Dahuk Center	178				70								
5	Wazha	Chowarta Center	Dahuk		4		13									6
6	Wazha	Chowarta Center	Dahuk		5	50										5
7	Wazha	Chowarta Center	Dahuk		4	80										
8	Wazha	Chowarta Center	Chwarta		17	40										1
9	Wazha	Dahuk	Dahuk		18											1
10	Welader	Arbat	Dahuk Center	291			2	880								
11	Kani Panka	Arbat	Sulaimaniya Center	38	26	34	73		42	33	35	42			42	
12	Welader	Arbat	Sulaimaniya/ Dokanian	107				321								
12	Welader	Arbat	Sulaimaniya/ Dokanian	185				95								
14	Welader	Arbat	Sulaimaniya/ Dokanian	80				200								
15	Welader	Arbat	Sulaimaniya/ Dokanian	480				1,158								
16	Chingnyan	Barzinja	Chwarta										267			
17	Chingnyan	Barzinja	Dahuk										717			
18	Chingnyan	Barzinja	Chwarta										194			7
19	Chingnyan	Barzinja	Chwarta										183			
20	Chingnyan	Barzinja	Chwarta										228	19		

Table No. 3 Total number of selected grape vines benchmarked in Sulaymaniyah governorate																
#	Village	Sub-District	District	Grape Varieties												
				shmiree	Rashmiree Wazha	Bae-dank-seedless	Thomson-seedless	Tre-Rash	Rash-Miow	Taefee	Kamali	Soor Ssinaee	Kazhaw	Sarquola	Zarek	Soraw
21	Jafaran	Qaradagh	Sulaimaniya Center				40					11				
22	Jafaran	Qaradagh	Sulaimaniya Center				196					40				
23	Welader	Arbat	Sulaimaniya Center	322												
Total				1,681	187	322	424	2,759	146	137	105	93	1,624	87	66	41
Grand total of grape varieties benchmarked in Sulaymaniyah Governorate through 10/31/05: 7,672 vines																

Annex II

Coordinates of Benchmarked Vineyards

Table No.4 Longitude & latitude (GPS) for the vineyards benchmarked in Dahuk Governorate					
#	**Village**	**Sub-District**	**District**	**N.**	**E.**
1	Bare Bahar	Zawita	Dohuk Center	36.52721 ^{o}	O43.06412 ^{o}
2	Bare Bahar	Zawita	Dohuk Center	36.52487 ^{o}	O43.05746 ^{o}
3	Besfke	Mangesh	Dohuk Center	36.59243 ^{o}	O43.06103 ^{o}
4	Besfke	Mangesh	Dohuk Center	36.58984 ^{o}	O43.04763 ^{o}
5	Bru Hajara	Mangesh	Dohuk Center	37.00463 ^{o}	O42.58062 ^{o}
6	Alikina	Mangesh	Dohuk Center	37.00057 ^{o}	O43.01337 ^{o}
7	Bade	Zawita	Dohuk Center	36.54358 ^{o}	O43.06099 ^{o}
8	Khizawa	Batofa	Zakho	37.11502 ^{o}	O42.57990 ^{o}
9	Nasarka	Dohuk Center	Dohuk Center	36.50263 ^{o}	O43.02044 ^{o}
10	Eminuk	Zawita	Dohuk Center	36.51900 ^{o}	O43.04833 ^{o}
11	Ashawa	Sarsink	Amadi	37.02074 ^{o}	O43.18472 ^{o}
12	Tazhika	Sarsink	Amadi	37.01787^{o}	O43.16407 ^{o}
13	Maidan Rovi	Sarsink	Amadi	37.03138 ^{o}	O43.21102 ^{o}
14	Siyaratika	Sarsink	Amadi	36.59913 ^{o}	O43.01289 ^{o}
15	Bagera	Mangesh	Dohuk Center	36.57551 ^{o}	O43.09792^{o}

Table No. 5 Longitude & latitude (GPS) for the vineyards benchmarked in Erbil Governorate					
#	**Village**	**Sub-District**	**District**	**N.**	**E.**
1	Ainkawa Center	Ainkawa	Erbil Center	36.25768 º	O43.98867 º
2	QaraChinaga	Qushtapa	Erbil Center	36.06250º	O44.03966 º
3	Shaqlawa center	Shaqlawa	Shaqlawa	36.39167 º	O44.36026
4	Shaqlawa center	Shaqlawa	Shaqlawa	36.38664 º	O44.35895 º
5	Shaqlawa center	Shaqlawa	Shaqlawa	36.38769 º	O44.35896 º
6	Shaqlawa center	Shaqlawa	Shaqlawa	36.38881 º	O44.35879 º
7	Upper Aquban	Hiran	Shaqlawa	36.34915 º	O44.40066 º
8	Upper Aquban	Hiran	Shaqlawa	36.34840 º	O44.39425 º
9	Upper Aquban	Hiran	Shaqlawa	36.34801 º	O44.39416 º
10	Upper Aquban	Hiran	Shaqlawa	36.34780 º	O44.39407 º
11	Kolka Rash	Hiran	Shaqlawa	36.26597 º	O44.55032 º
12	Gird Jotyar	Ainkawa	Erbil Center	36.27002º	O44.01324 º
13	Spegara	Hiran	Shaqlawa	36.38699 º	O44.36903 º
14	Shaqlawa center	Shaqlawa	Shaqlawa	36.38622º	O44.34804 º
15	Pongina	Hiran	Shaqlawa	36.32815 º	O44.43851 º
16	Sitkan	Diana	Soran	36.66071º	O44.62825 º
17	Sitkan	Diana	Soran	36.66224 º	O44.62992 º
18	Sitkan	Diana	Soran	36.66190 º	O44.63023 º
19	Sitkan	Diana	Soran	36.67275 º	O44.61407 º
20	Sitkan	Diana	Soran	36.69238 º	O44.60277 º
21	Shaqlawa center	Shaqlawa	Shaqlawa	36.38511 º	O44.34807 º
22	Dargala	Rawanduz	Soran	36.56638 º	O44.70122 º
23	Dargala	Rawanduz	Soran	36.56778 º	O44.70144 º

Table No. 6 Longitude & latitude (GPS) for the vineyards benchmarked in Sulaymaniyah Governorate

#	Village	Sub-District	District	N.	E.
1	Wazha	Chowarta Center	Chwarta	35.73430 ^{o}	O45.49988 ^{o}
2	Wazha	Chowarta Center	Chwarta	35.73400 ^{o}	O45.49939 ^{o}
3	Halabja Center	Sirwan	Halabja	35.37639^{o}	O45.72105 ^{o}
4	Welader	Arbat	Sulaimaniya Center	35.54406^{o}	O45.53494 ^{o}
5	Wazha	Chowarta Center	Chwarta	35.73070 ^{o}	O45.49533 ^{o}
6	Wazha	Chowarta Center	Chwarta	35.73570 ^{o}	O45.50340 ^{o}
7	Wazha	Chowarta Center	Chwarta	35.74415 ^{o}	O45.50824 ^{o}
8	Wazha	Chowarta Center	Chwarta	35.74492 ^{o}	O45.50707 ^{o}
9	Wazha	Chowarta Center	Chwarta	35.74007 ^{o}	O45.50913 ^{o}
10	Welader	Arbat	Sulaimaniya Center	35.53773 ^{o}	O45.53899 ^{o}
11	Kani Panka	Arbat	Sulaimaniya Center	35.37639 ^{o}	O45.72105 ^{o}
12	Welader	Arbat	Sulaimaniya/ Dokanian	35.54413 ^{o}	O45.53528 ^{o}
13	Welader	Arbat	Sulaimaniya/ Dokanian	35.54266 ^{o}	O45.53378 ^{o}
14	Welader	Arbat	Sulaimaniya/ Dokanian	35.54645 ^{o}	O45.53435 ^{o}
15	Welader	Arbat	Sulaimaniya/ Dokanian	35.52995 ^{o}	O45.54591 ^{o}
16	Chingnyan	Barzinja	Chwarta	35.62920 ^{o}	O45.62134 ^{o}
17	Chingnyan	Barzinja	Chwarta	35.62782 ^{o}	O45.62682 ^{o}
18	Chingnyan	Barzinja	Chwarta	35.63218 ^{o}	O45.61767 ^{o}
19	Chingnyan	Barzinja	Chwarta	35.63456 ^{o}	O45.61355 ^{o}
20	Chingnyan	Barzinja	Chwarta	35.63542 ^{o}	O45.61855 ^{o}
21	Jafaran	Qaradagh	Sulaimaniya Center	35.32656 ^{o}	O45.32922 ^{o}
22	Jafaran	Qaradagh	Sulaimaniya Center	35.32185 ^{o}	O45.32100 ^{o}
23	Welader	Arbat	Sulaimaniya Center	35.53404 ^{o}	O45.54308 ^{o}

Annex III

Weekly Distribution of Field Teams

Table No.8 Weekly Distribution of Field Teams in Dahuk Governorate				
Week	**Dates**	**No. of sites visited**	**No. of vines identified**	**Villages**
1	October 2 - 6, 2005	1	2,040	Bari Bahar
2	October 8 - 13, 2005	3	7,800	Bari Bahar and Besifki
3	October 16 - 20, 2005	3	9,300	Baro Hajar, Alkina and Badi
4	October 22 - 27, 2005	6	2,850	Khizawa , Nasarka ,Eminuk and Ashawa
5	October 29 - 31, 2005	4	1,515	Tazhika,Maidan Rovi ,Siyaratika and Bagera
Total		**17**	**23,505**	

Table No. 9 Weekly Distribution of Field Teams in Erbil Governorate				
Week	**Dates**	**No. of sites visited**	**No. of vines identified**	**Villages**
1	September 24 - 29, 2005	3	2,281	Ainkawa Center,QaraChinaga and Shaqlawa center
2	October 1 - 6, 2005	8	2,536	Shaqlawa center,Upper Aquban and Kolka Rash
3	October 8 - 13, 2005	4	1,894	Gird Jotyar, Spegara Shaqlawa and Pongina
4	October 16 - 20, 2005	7	784	Sitkan and Shaqlawa center
5	October 30 - 31, 2005	2	300	Dargala
Total		**24**	**7,795**	

Table No. 10 Weekly Distribution of Field Teams in the Sulaymaniyah Governorate				
Week	**Dates**	**No. of sites visited**	**No. of vines identified**	**Villages**
1	October 4 - 6, 2005	4	1,040	Wazha.Halabja and Welader
2	October 8 - 13, 2005	7	1,782	Wazha. Welader and Kani Panka
3	October 16 - 20, 2005	4	2,626	Welader
4	October 22 - 27, 2005	5	1,615	Chingnyan
5	October 29 - 30, 2005	3	609	Welader and Jafaran
Total		**23**	**7,672**	

Annex IV

Distribution of Cuttings

Table No. 10 Distribution of produced cuttings in Dahuk Governorate								
#	Variety Name	No. of Benchmarked trees	No. of cutting from each tree	Total produced cuttings	to be planted in Dohuk	to be sent to Erbil	to be sent to Sulaimaniyah	Remark
1	Kamali	3,790	40	165,000	70,000	36,000	59,000	13,500 extra cuttings will be produced
2	Zarek	5,000	18	91,000	60,000	13,000	18,000	
3	Rash-Miow	9,500	30	293,000	100,000	99,000	94,000	8,000 extra cuttings will be produced
4	RashMiow (Elongated)	1,300	30	40,000	15,000	10,000	15,000	1,500 extra cuttings will be produced
5	Taefee	1,800	25	45,000	30,000	10,000	5,000	
6	Rashmiree	115	30	3,500	3,500			
7	Tre-Rash	200	30	6,000	6,000			
8	Besola	1,710	25	42,000	22,000	10,000	10,000	
9	Thomson-seedless	20	25	500	500			
10	Hejazi-Spee	45	70	3,000	1,000	1,000	1,000	
11	Jav-Ga	25	25	600	300	300		
Total		**23,505**		**689,600**	**308,300**	**179,300**	**202,000**	**23,000**

Table No .11 Distribution of produced cuttings in Erbil Governorate								
#	Variety Name	No. of Benchmarked trees	No. of cutting from each tree	Total produced cuttings	to be planted in Erbil	to be sent to Dohuk	to be sent to Sulaimaniyah	Remark
1	Rashmiree	1,684	40	70,000	50,000	20,000		3,000 extra cuttings can be produced
2	Thomson-seedless	1,696	45	76,000	50,000	23,000	3,000	
3	Kamali	355	40	14,000	14,000			
4	Tre-Rash	2,916	30	88,000	70,000	18,000		12,000 extra cuttings can be produced for Dohuk instead from SUL
5	Rashmiree Wazha	319	40	13,000	10,000	3,000		
6	Rash-Miow	83	20	1,600	1,600			
7	Soraw	118	20	2,400	1,200	1,200		
8	Halwani	116	50	6,000	6,000			
9	Taefee	105	20	2,000	2,000			
10	Des-AlAnnz	63	30	2,000	2,000			
11	Zarek	40	20	1,000	1,000			
12	Awilka	300	35	10,000	6,000	2,000	2,000	
Total		**7,795**		**286,000**	**213,800**	**67,200**	**5,000**	

Table No.12 Distribution of produced cuttings in Sulaymaniyah Governorate								
#	Variety Name	No. of Benchmarked trees	No. of cutting from each tree	Total produced cuttings	to be planted in Sul	to be sent to Erbil	to be sent to Dohuk	Remark
1	Rashmiree	1,681	30	50,000	50,000			
2	Tre-Rash	2,759	30	82,000	70,000		12,000	the seedlings can be taken from Erbil
3	Kazhaw	1,624	25	40,000	20,000	10,000	10,000	
4	Rashmiree Wazha	187	50	9,000	8,000		1,000	the seedlings can be taken from Erbil
5	Bae-dank-seedless	322	40	13,000	8,000	3,000	2,000	
6	Thomson-seedless	424	40	17,000	17,000			
7	Soraw	41	40	1,600	1,600			
8	Rash-Miow	146	40	6,000	6,000			
9	Taefee	137	35	5,000	5,000			
10	Kamali	105	35	3,600	3,600			
11	Soor Ssinaee	93	30	3,000	1,000	1,000	1,000	
12	Sarquola	87	25	2,000	2,000			
13	Zarek	66	30	2,000	2,000			
Total		**7,672**		**234,200**	**194,200**	**14,000**	**26,000**	

Table No. 13 Distribution of produced cuttings									
#	Variety Name	Produced cuttings in the Three Governorates				Propsed planting cuttings in the Three Governorates			Cuttings from Baghdad
		Erbil	Dohuk	Sulaymaniya	Total	Erbil	Dohuk	Sulaymaniya	
1	Rashmiree	70,000	3,500	50,000	123,500	50,000	23,000	50,000	
2	Tre-Rash	88,000	6,000	82,000	176,000	70,000	36,000	70,000	
3	Kamali	14,000	165,000	3,600	182,600	50,000	70,000	63,000	
4	Zarek	1,000	91,000	2,000	94,000	14,000	60,000	20,000	
5	Rash-Miow	1,600	293,000	6,000	300,600	100,000	100,000	100,000	
6	RashMiow (Elongated)		40,000		40,000	10,000	15,000	15,000	
7	Thomson-seedless	76,000	500	17,000	93,500	50,000	23,000	20,000	
8	Besola		42,000		42,000	10,000	22,000	10,000	
9	Bae-dank-seedless			13,000	13,000	3,000	2,000	8,000	
10	Taefee	2,000	45,000	5,000	52,000	12,000	30,000	10,000	
11	Rashmiree Wazha	13,000		9,000	22,000	10,000	4,000	8,000	
12	Soraw	2,400		1,600	4,000	1,200	1,200	1,600	
13	Kazhaw			40,000	40,000	10,000	10,000	20,000	
14	Halwani	6,000			6,000	10,000	10,000	10,000	24,000
15	Des-AlAnnz	2,000			2,000	2,000			
16	Hejazi-Spee		3,000		3,000	1,000	1,000	1,000	
17	Soor Ssinaee			3,000	3,000	1,000	1,000	1,000	
18	Sarquola			2,000	2,000	1,000		1,000	
19	Jav-Ga		600		600	300	300		
20	Awilka	10,000			10,000	6,000	2,000	2,000	
Total		**286,000**	**689,600**	**234,200**	**1,209,800**	**411,500**	**410,500**	**410,600**	**24,000**
Note : the other grape varieties can be brought from Baghdad such as Buhrazi , Abbasi, Franci and Shada Sauda									

Annex V

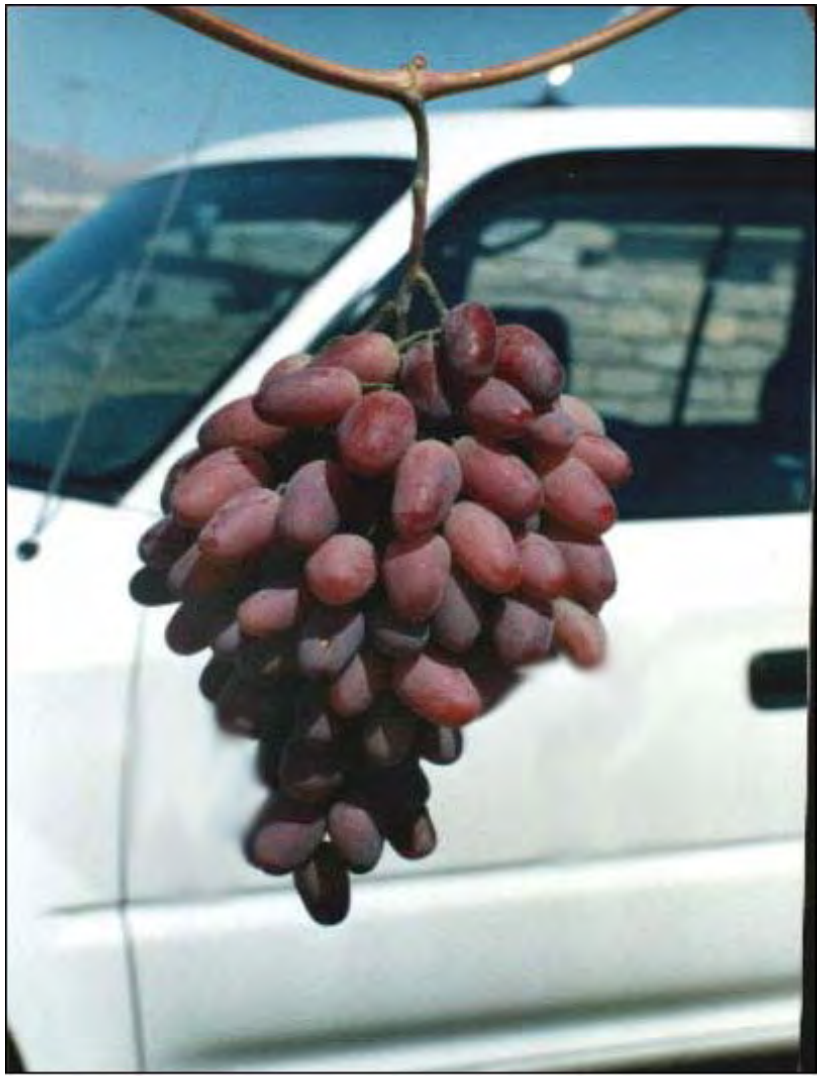
Pictures of Selected Varieties

RASH-MIOW رشميو

DOHUK بري بهار

ZAREK زرك

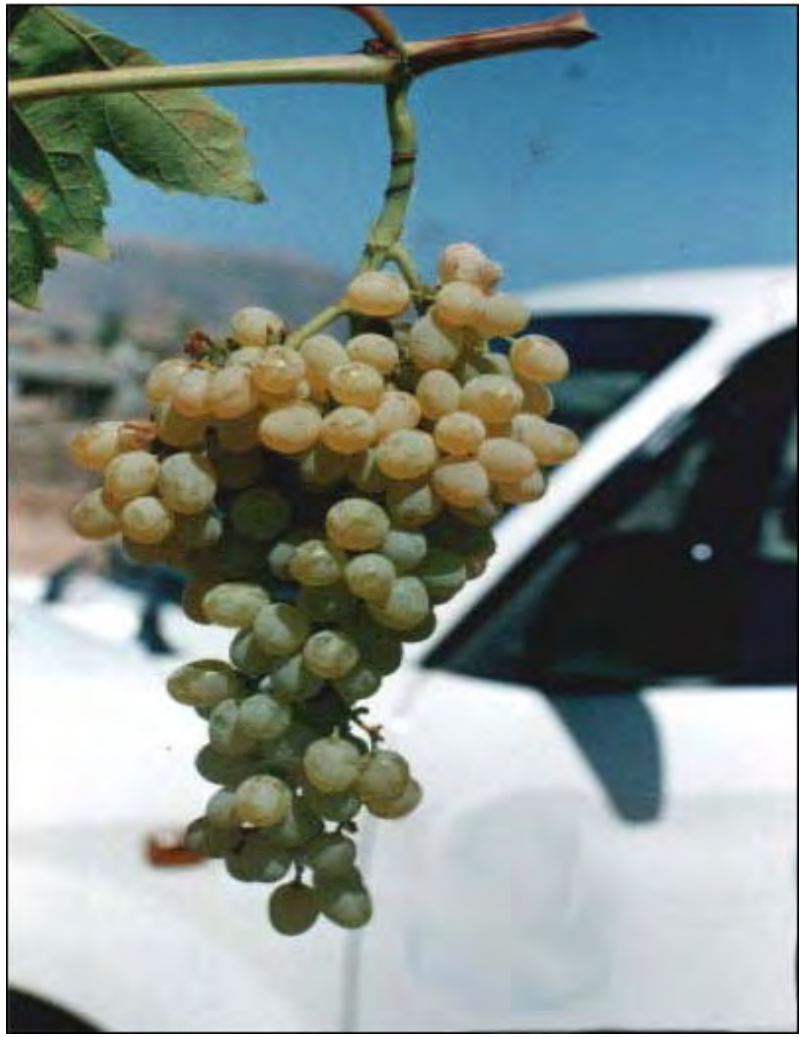
DOHUK دركجنيك



KAMALI DOHUK

كمالي بري بهار/ أزادي

BAE-DANK (عديم البذور) بيدنك
Sulaimaniyah -Wazha



كشمش أبيض THOMPSON-SEEDLESS

آزادي-سرسنك DOHUK

ديس العنز DES-ALANNZ

بري بهار DOHUK

صوراو (صور شامي) SORAW

شقلاوه ERBIL

جاف كا(عين الثور) JAV-GA

أيمنكي DOHUK

AWILKA **أويلكا**
ERBIL **سيتكان**

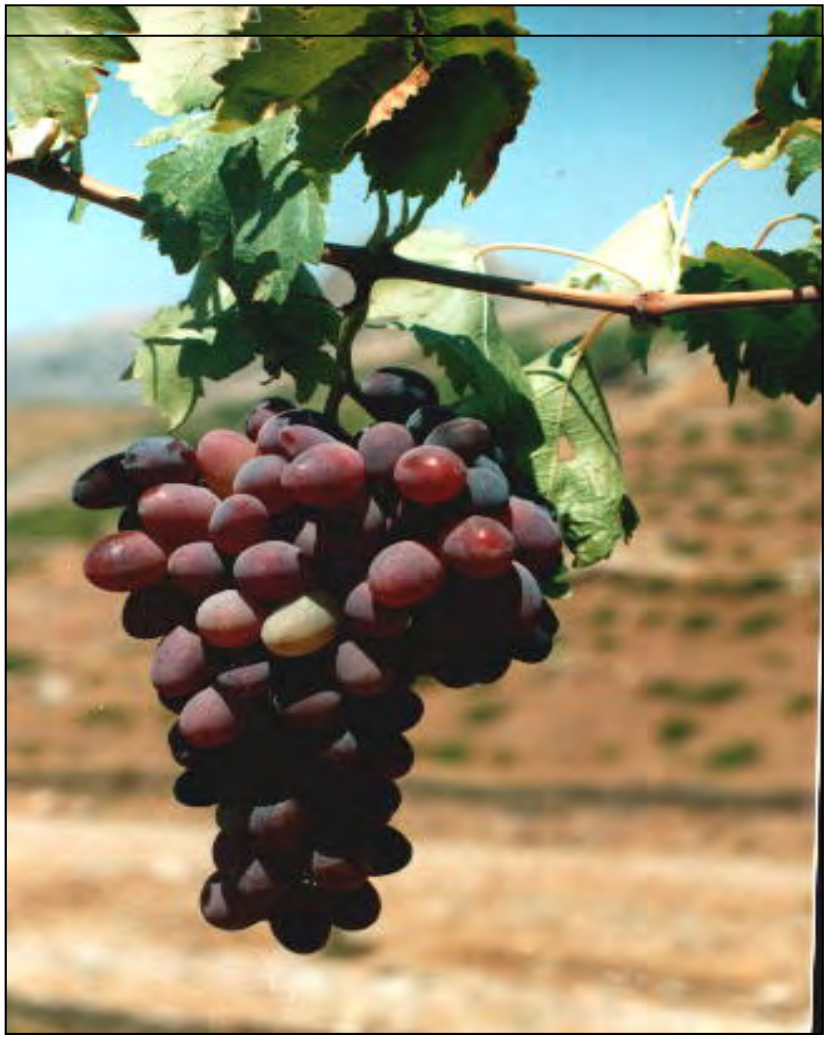
BESOLA بيصوله
DOHUK أشاوى

RASH-MIREE رشميري

SULAIMANIYA دوكنيان

TRE-RASH تري رش

ERBIL ماوليان



TAEFEE-RED طائفي أحمر

SULAIMANIYA سركلو

RASHMIREE-WAZHA

رشميري واجه

SULAIMANIYA واجه

SARQUOLA سرقوله

SULAIMANIYA جنكيان

THOMPSON- SEEDLESS

كشمش أبيض

KAZHAW كازاو

SULAIMANIYA جنكيان

SOORSSINAEE سورسني

SULAIMANIYA جاعفران

Hejazi -Spee

Dohuk

KAMALI كمالي